AU THORS:

Yaroslavskiy, N.G. and Stanevich, A. Ye

SOV/51-5-4-6/21

TITLE:

Rotational Spectrum of H20 in the Long-Wavelength Infrared Region 50-1500 pt (200-7 cm<sup>-1</sup>). (Vrashchatel'nyy spektr H20 v dlinnovolnovoy

infrakrasney oblasti 50-1500 to (200-7 cm-1) ).

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 4, pp 384-392 (USSR)

ABS TRACT:

A vacuum spectrometer DIKS-1, described in Refs 11, 12, was used. An optico-accustical receiver, developed by Pankratov (Ref 13), was used instead of a thermo-element. The best resolution was 0.2-0.7  ${
m m}^{-1}$ and the mean error in wave-number determination was 0.02 cm The intensities were measured to within 10%. Five interchangeable echelette gratings were used: three of them were prepared in F.L. Gerasimov's laboratory and had constants of 0.0833, 0.1666 and 0.5 mm (12, 6 and 2 lines per mm) and the other two, with 1.5 and 2.5 mm constants, were cut using a precision lathe. The light sources were a platinum ribbon covered with thorium oxide and heated electrically to 1530°K (for 50-100 μ wavelengths) and a mercury lamp PRK-4 (for 100-1500 μ wavelength;),

Figs 1 and 2 show the H2O vapour spectra in the 50-1500 µ region, obtained at pressures from 1 to 750 mm Hg, relative humidity of 80% and at room temperature. 105 absorption bands were recorded in the

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Rotational Spectrum of  $H_0$  in the Long-Wavelength Infrared Region 50-1500  $\mu$  (200-7 cm<sup>-1</sup>).

50-1500 \$\mu\$ spectral region. 94 of them were interpreted as fundamental frequencies of the rotational spectrum and 11 of them as some of the fundamental frequencies which appeared in the second order of the spectrum. The table on pp 387-8 gives complete interpretation of all the observed absorption bands. The wave-numbers of these bands are compared with the wave-numbers calculated from the values of rotational energies given in Ref 6. The difference between the experimentally observed and calculated wave-numbers is about 0.02 cm<sup>-1</sup>, i.e. it lies within the experimental error. Fig 3 gives the rotational spectrum of H<sub>2</sub>0 in the region 50-1500 \$\mu\$ (200-7 cm<sup>-1</sup>). The 34 bands recorded or resolved for the first time are marked with the

Card 2/3

Rotational Spectrum of  $H_0$  in the Long-Navelength Infrared Region 50-1500  $\mu$  (200-7 cm<sup>-1</sup>).

plus sign (+). The authors thank N.A. Pankratov and M.L. Veyngercy for supply of optico-acoustical receivers. There are 3 figures, 1 table and 16 references, 7 of which are American, 6 Soviet and 3 German.

ASSOCIATION: Gosudars tvennyy opticheskiy institut im. S.I. Vavilova (State Optical Institute imeni S.I. Vavilov)

SUBMITTED: December 23, 1957

1. Water--Spectra 2. Spectrum analyzers--Equipment

Card 3/3

YAROSLAVSKIY, N.G.; STANEVICH, A.Ye.

Simplified spectrometers for long-wave infrared region from 20 to 180 At. Inzh.-fiz. zhur. na. 6:50-55 Je '58. (MIRA 11:7)

(Spectrometer)

Comparative study of the radiation capacity of some infrared radiation sources in the 20-110 wave range. Inzh.-fiz.zhur. no.7:49-53 J1 '58. (MIRA 11:8)

AUTHORS:

Yaroslavskiy, N. G., Stanevich, A. Ye.

SOV/48-22-9-38/40

Rotation Spectrum of H20 Vapor in the Range of

TITLE:

50 - 1500μ (200 - 7 cm<sup>-1</sup>)(Vrashchatel'nyy spektr parov

 $H_2O \text{ v oblasti } 50 - 1500\mu (200 - 7 \text{ cm}^{-1}))$ 

.

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958,

Vol 22, Nr 9, pp 1145 - 1149 (USSR)

ABSTRACT:

PERIODICAL:

This report presents the results for the investigation of the rotation spectrum of H<sub>2</sub>O in the range of 50 : 1500 µ at varying steam pressure and under optimum recording conditions. The absorption spectra optimum recording conditions at mosphere were recorded

of the H<sub>0</sub>O vapors in room atmosphere were recorded with the long-wave vacuum spectrometer, DIKS -- 1 (Refs 11,12).

The thermocouple and the photoelectron optical multiplier was replaced by an optic-acoustical radiation receiver. This device was recently developed by N.A.Pankratov (Ref 13). It permits to measure the absorption spectra of different objects in the range of 50 1500 with a maximum resolution of 0,2-0,3 cm<sup>-1</sup>, an average accuracy

Card 1/2

Rotation Spectrum of  $H_2^0$  Vapor in the Range of 50 -- 1500  $\mu(200 \cdot \cdot 7 \text{ cm}^{-1})$ 

SOV/48-22-9-38/40

of the wave numbers of  $0.02 \text{ cm}^{-1}$  and an error of the intensities less than 10%. The readings are recorded on an automatic recorder. In order to cover the entire spectral range 5 interchangeable gratings were used: three of these with constants equaling 0,0833, 0,1666 and 0,5 were produced in the laboratory of F.M.Gerasimov and two, with the constants 1,5 and 2,5 were produced on a precision milling cutter. A thorium oxide coated platinum band heated to 1580° was used as a source of radiation in the range of 50  $\div$  100  $\mu$  . In the range 100 + 1500 μ a mercury lamp PRK-4 was used. In order to exclude the spectra of higher order and that of the diffuse short-wave radiation, a selective modulation at a frequency of 9 c and reflex filters and pass filters were used. 105 absortion bands were recorded in the entire range investigated. 84 were interpreted to be ground frequencies of the rotation spectrum and 11 to be second order frequencies (Table). The scheme of the rotation spectrum is given in figure 2. There are 2 figures, 1 table, and 13 references, 3 of which are Soviet.

Card 2/2

SOV/51-6-6-15/34

24(7) AUTHORS: Yaroslavskiy, N.G. and Stanevich, A.Ye.

TITLE:

Rotational Spectrum of H<sub>2</sub>O Vapour and Absorption by Moist Air in the Wavelength Region from 40 to 2500 Microns (Vrashchatel'nyy spektr parov H<sub>2</sub>O i pogloshcheniye vlazhnogo vozdukha v oblasti dlin voln ot 40 do 2500 mikron)

PERIODICAL:Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 799-801 (USSR)

ABSTRACT: No experimental data have yet been published on the rotational infrared spectrum of H<sub>2</sub>O vapour at wavelengths longer than 1400 μ (for the rotational spectrum of H<sub>2</sub>O below 1400 μ see an earlier paper by the present authors, Ref 1). The present paper reports experimental results obtained in measurement of the infrared spectrum of H<sub>2</sub>O vapour particularly in the region 1400-2500 μ (7.15-4.0 cm<sup>-1</sup>) and absorption by atmospheric air in the region from 40 to 2500 μ. The spectra were recorded by means of a vacuum infrared spectrometer DIKS-1 developed earlier (Refs 5-7). To cover the whole region from 40 to 2500 μ the authors used six echelettes of 270 x 270 mm dimensions and the following constants: 0.083(3), 0.166(6), 0.50, 1.50, 2.50 and 5.00 mm. A mercury lamp PRK-4 was used as the source and an optico-acoustic receiver OAP-1 with a crystalline quartz window was employed. The spectra were

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SOV/51-6-6-15/34

Rotational Spectrum of H<sub>2</sub>O Vapour and Absorption by Moist Air in the Wavelength Region from 40 to 2500 Microns

recorded by means of an electronic potentiometer EPP-09. The spectra of higher orders than the first and scattered short-wavelength radiation were removed by selective modulation and by various combinations of reflection and transmission filters. Fig 1 shows the 1000-2500 μ absorption curve (II) of a column of air 7.5 mm long at 20°C and 60% relative humidity. Curve I in Fig 1 represents the emission spectrum of the mercury lamp PRK-4 recorded under the same conditions as curve II. Comparison of the curves I and II shows clearly an absorption band of atmospheric air at 1634 µ. This band is due to water vapours present in air and corresponds to the transition 22 3-2 (6.12 cm-1) between rotational levels of H20. whose energies were calculated by Benedict et al (Ref 2). This band was observed using microradiowaves at 1628 µ (6.14 cm-1) by King and Gordy (Ref 3). Fig 1 shows that, apart from the band at 1634 mu, atmospheric air absorbs very little between 1200 and 2500 µ. Fig 2 gives the spectrum of the optical density D in the region  $40-2500~\mu$  for a column of air of length 10 m at 20°C, 760 mm Hg and 60% relative humidity.

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Rotational Spectrum of H2O Vapour and Absorption by Moist Air in the Wavelength Region from 40 to 2500 Microns

Fig 2 shows that there are three regions of high transparency: at 350  $\mu$ , 1300  $\mu$  and from 1700  $\mu$  to 2500  $\mu$  ( and probably beyond). The authors point out that the errors in determination of the optical density in the last two regions of transparency were several times higher than the quantity measured. There are 2 figures and 7 references, 4 of which are Soviet and 3 English.

Oard 3/3

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507/51-7-5-7/21

AUTHORS:

Yaroslavskiy, M.G. and Stunovich, A. Yo.

TITLE:

The Long-Mavelength Infrared Spectrum of H2O Vapours and Absorption

in Atmospheric Air in the Region 20-2500  $\mu$  (500-4 cm<sup>-1</sup>).

PERIODICAL:

Optika i spektroskopiya, 1959, Vol 7, Nr 5, pp 626-631 (USSR)

ABS TRACT:

The authors report a study of the rotational spectrum of H2O at wavelengths from 1400 to 2500  $\mu$  and of transparency of atmospheric air in a closed room at wavelengths from 20 to 2500 µ (transparency of air between 18 and 2500  $\mu$  is governed by absorption of water vapour present in air). A DIKS-1 infrared spectrometer was used in the first order with six echelettes of 270 x 270 mm dimensions. Three echelettes with 12, 6 and 2 lines/mm were made on a precision ruling machine in F.M. Gerasimov's laborabry. The other three echelettes with 1.5, 2.5 and 5.0 mm constants and a blaze angle of about 100 were made using an ordinary milling machine. The following sources were used: a platinum ribbon, covered with yttrium oxide and heated to 1200°C (it was used in the 20-50  $\mu$  region) and a mercury lamp PRK-4 (in the 50-2500 μ region). Cotico-acoustic receivers with hermetically sealed chambers, fitted with caesium iodide and quartz windows, were employed. The spectra were recorded automatically with an electronic potentiometer EPP-09. The mean error in determination of wave numbers amounted

Jn rd 1/3

SOV/51-7-5-7/21

The Long-Wavelength Infrared Spectrum of  $\rm H_{2}O$  Vapours and Absorption in Atmospheric Air in the Region 20-2500  $\mu$  (500-4 cm<sup>-1</sup>)

to 0.02 cm-1 and the error in determination of transmission varied The spectra of higher orders and scattered shortwavelength radiation were practically eliminated by the use of compensated selective modulation of the light beam, achieved by means of various combinations of reflection and absorption filters. In this way the short-wave scattered radiation was reduced to 3-5%. The results are shown in Figs 1-3. Curve I in Fig 26 represents the energy distribution in the spectrum of the mercury lamp PRK-4, which was continuously pumped to keep the pressure at about 1 mm Hg; curve II of the same figure represents the spectrum of the same lamp when it was filled with air, which contained 10.5 g of water per 1 m3 (relative humidity 60%) at 20°C and 760 mm Hg. Comparison of curves I and II shows a clear absorption band at 1634  $\mu$  ( $\nu$  = 6.12 cm<sup>-1</sup>) which is due to H<sub>2</sub>O vapours and represents a transition between the rotational levels with quantum numbers  $J_{\tau}^{H} = 22$  and  $J_{\tau}^{I} = 3_{-2}$ , whose energies were calculated by Benedikt, Classen and Shaw (Ref 6). The wave-number of this band (6.12 cm-1) agrees, within the experimental error (0.02 cm-1), with the wave-number of 6.14 cm-1 (1628 µ), determined by microwave spectroscopy (Ref 6). The absorption by air in a closed room at 20-2500 μ is shown in Figs 1 and 2, where curves I represent the results

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9,5320

S/051/61/010/004/005/007 E032/E314

AUTHORS:

Stanevich, A.Ye. and Yaroslavskiy, N.G.

TITLE:

Absorption by Liquid Water in the Long Wavelength Region of the Infrared Spectrum (42 - 2 000  $\mu$ )

PERIODICAL: Optika i spektroskopiya, 1961, Vol. 10, No. 4, pp. 538 - 540

TEXT: The aim of this work was to investigate the absorption by liquid water of  $42-2\,000\,\mu$  radiation and to check on the data reported by Rubens and Ladenburg (Refs. 13, 14) and Cartwright and Errera (Refs. 15-18) in the region up to  $300\,\mu$ . The measurements were taken with the vacuum long-wavelength spectrometer  $\Delta NKC-1$  (DIKS-1) described by Yaroslavskiy. Zheludov and Stanevich in Refs. 20-22. Fig. 1 shows the transmittance T and the optical density D of ordinary water in a  $13\,\mu$  layer at room temperature. The dashed curve in this figure shows the absorption constant calculated from the formula:

X

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S/051/61/010/004/005/007 E032/E314

Absorption by ....

$$k = \frac{\lambda \ln \frac{1}{T}}{4\pi d}$$

where T is the transmittance in relative units,

 $\lambda$  is the wavelength in  $\mu$ , and

d is the thickness of the absorbing layer in  $\mu$ .

The analogous results for heavy water are shown in Fig. 2. In these figures, S is the spectral slit width;  $\sim$  v is the time constant (sec) multiplied by the rate of recording (cm/sec). Comparison of these data with those reported by Rubens et al (Refs. 13-18) shows good agreement at  $\lambda = 52$ , 152 and 313  $\mu$ . The wave numbers of the absorption maxima shown in Fig. 1 are, respectively, 232, 210, 191, 175, 160 and 145 cm<sup>-1</sup>, while those in Fig. 2 are 221, 196,

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20/2/ \$/051/61/010/004/005/007 E052/E314

Absorption by ....

181, 166, 156 and 140 cm<sup>-1</sup>. There are 2 figures and 23 references: 4 Soviet and 19 non-Soviet.

SUBMITTED:

September 24, 1960

Fig. 1:

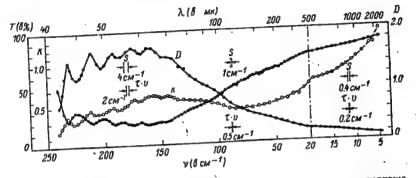


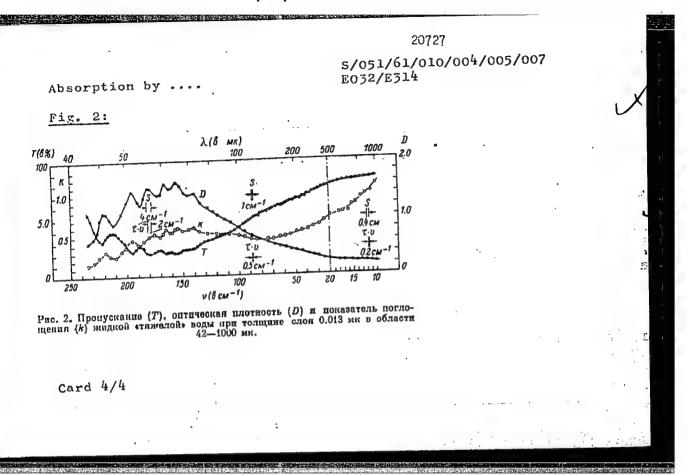
Рис. 1. Пропусквине (T), оптическая плотность (D) и показатель поглощения (k) жидкой воды пра толщине слоя 0.013 мк. в области 42—2000 мк. 

S— спектральная ширина шели (6 см<sup>-1</sup>); т. т— произведение постоянной времени (в сек.) присмноусилительного устройства на скорость регистрации (в см<sup>-1</sup>,сек.).

card 3/4

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652820016-0"



STANEVICH, A.Ye.; YAROSLAVSKIY, N.G.

Transmission of organic solvents in the long-wave infrared spectral region. Opt.i spektr. 11 no.1:61-66 J1 '61.

(MIRA 14:10)

(Solvents) (Molecular spectra)

Similavich, A.Ye.; The Oslaviskiy, M.G.

Low Precuency infrared a corption spectrum of the hydrogen lond in the liquid phase and in crystal hydrates. Dokl. AH (BERA 14:2) no. 1:00-00 fr-Ap (61.

1. Predst wlene chade alter 1.M. Tereninym.
(Nydregen bording--Spectra).

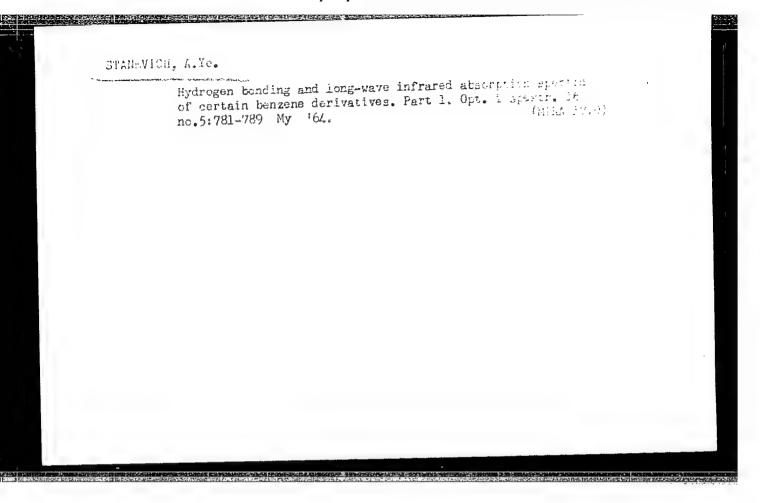
EWT(m)/EWP(j) SOURCE CODE: UR/0058/65/000/011/D028/D028 ACC NR: AR6016197 AUTHOR: Stanevich, A. Ye. TITLE: Natural vibrational spectrum of the hydrogen bond SOURCE: Ref. zh. Fizika, Abs. 11D219 REF SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3, vyp. 1, 1964, 146-151 absorption spectrum, carboxylic acid, benzene, hydrogen bonding TOPIC TAGS: ABSTRACT: The author investigated in the 240 - 30 cm2 the absorption spectra of a series of carboxylic acids/and certain benzene derivatives. Comparison of the spectra of the investigated substances, and also an analysis of the changes which occur in the spectra of the substances as their phase states change, have made it possible to relate certain absorption bands with the natural vibrations of the hydrogen bond. The values of the quasielastic constants of the hydrogen bond in the investigated substances are determined and it is shown that these values are in good agreement with the corresponding values calculated by starting from the semiempirical potential function for the bond of Lippincott and Schroeder. [Translation of abstract] SUB CODE: 20, 07 LS Card

STANEVICH, A.Ye.

Long-wave infrared absorption spectra of carbonic acids, Opt.

i spektr. 16 no.3:446-454 Mr '64.

(MIRA 17:4)



STANEVICH, A.Ye.

Hydrogen bonding and the long-wave infrared absorption spectra of certain benzene derivatives. Part 2. Opt. i spektr. 16 no.6:998-1003 Je \*64.

### "APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652820016-0

L 05699-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(e) GU/WL/JD ACC NR: AP6026352 SOURCE CODE: UR/0237/66/000/005/0001/0004

AUTHOR: Stanewich, A. Ye.; Yaroslavskiy, N. G.

ORG: none

TITLE: Absolute emissive power of PRK-4 mercury lamp in the longwave infrared range  $(50-2000 \ \mu)$ 

SOURCE: Optiko-mekhanicheskaya promyshlennost, no. 5, 1966, 1-4

TOPIC TAGS: light emission, emissivity, mercury lamp

ABSTRACT: Measurements of the absolute emissive power of a PRK-4 mercury lamp were made under its normal operating conditions (current of 4 A) in the range of 50 to 2000 μ with a DIKS-1 spectrometer. The emitted energy E, was determined from the signal-to-noise ratio measured at various points of the spectrum, and from the values obtained, the spectral intensity r, was calculated. Comparison of the absolute emissive power thus obtained with the emissive power of a black body shows that in the range above 200 μ the radiation intensity of PRK-4 surpasses that of a black body at 1500°, and at 1000 μ reaches a value corresponding to the radiation of a black body heated to approximately 6000°K. The spectral range for the most effective use of the mercury lamp and thermal sources of radiation was determined by comparing their relative radiation intensities: in the wavelength range above 130 μ, the radiation intensity of the mercury lamp surpasses that of a thermal source (platimum strip coated with yttrium

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UDC: 535.33:621.327.534

| oxide). H                       | ALIAWAW B | ince the | intensity  | of shortwa                 | ve rad         | iation of               | a mercury | lamp is | mich |
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ACC NR: AP7005651

SOURCE CODE: UR/0413/67/000/002/0100/0101

INVENTOR: Lobachev, M. V.; Sokol'skiy, M. N.; Stanevich, A. Ye; Yaroslavskiy, N. G.

ORG: None

TITLE: A double-beam spectrophotometer. Class 42, No. 190615 [announced by the Leningrad Opticomechanical Society (Leningradskoye optiko-mekhanicheskoye ob"yed-incniye)]

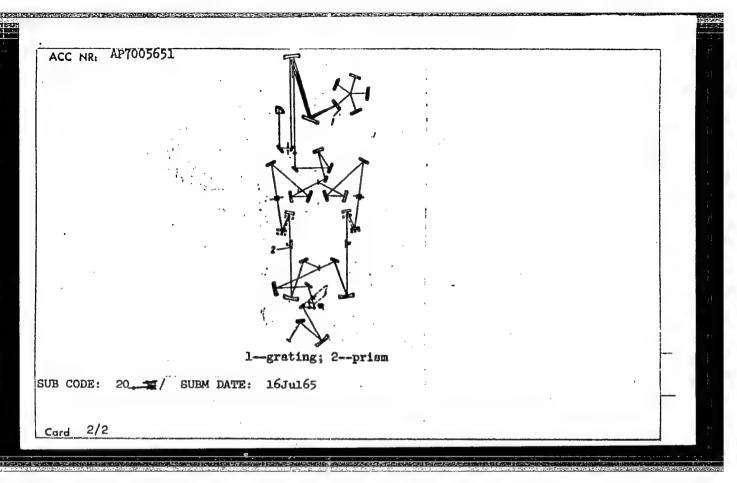
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1967, 100-101

TOPIC TAGS: spectrophotometer, IR optic system, diffraction grating, optic instrument

ABSTRACT: This Author's Certificate introduces: 1. A double-beam spectrophotometer with diffraction (echelette) gratings for operation in the far infrared spectral region (50-1000  $\mu$ ). The luminosity of the instrument is increased by making the gratings 1.5 times longer in the direction of the lines than in the direction of dispersion. 2. A modification of this spectrophotometer designed for measuring reflection spectra. A prism is mounted in the cell compartment with reflecting surfaces which break up the radiation flux with simultaneous displacement of the focusing elements.

Card 1/2

UDC: 53.853.36



SOV/51-7-2-20/34

AUTHORS:

Sall', A.O. and Stanevich, S.B.

TITLE:

Use of the Selective Emission of a Gas in Infrared Gas Analysers (Ispol'zovaniye izbiratel'nogo izlucheniya gaza v infrakrasnykh

gazoanalizatorakh)

PERIODIOLL: Optika i spektroskopiya, 1959, Vol 7, Nr 2, pp 256-258 (USSR)

ABSTRACT:

Radiation source in infrared gas analysers is usually a chrome-nickel spiral heated to 700-800°C. Selectivity of such gas analysers is ensured by the use of selective optico-acoustic receivers (Ref 1). The present note describes how selective emission of a hot gas may be used instead of a source with a continuous spectrum; the use of a selective source leads to an improved analyser selectivity. Fig la shows schematically an optico-acoustic gas analyser with selective radiation sources in the form of heated cylindrical chambers (1) filled with the gas (e.g. CO2) whose concentration is to be determined in a given mixture. The inner surfaces of both these chambers are chrome plated and polished. The radiation beams are interrupted at the same rate and phase by a perforated disk (2) at 6 c/s. The right-hand beam passes through the analysed mixture in a working chamber (3); the left-hand beam

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SOV/51-7-2-20/34

Use of the Selective Emission of a Gas in Infrared Gas Analysers

casses through a comparison chamber (4). Receiver cylinders (5) are filled with the gas whose concentration in the working chamber is to be determined (CO2 again). The difference between the pressures produced by the two radiation beams in the receiver cylinders is transformed by a condenser microphone (6) into an alternating voltage which is amplified (7) and recorded (8). The precision of this gas analyser depends primarily on the ratio F of the signal which is produced on introduction of CO2 into the working chamber to the signal produced by an uninterrupted radiation beam. Fig 2 shows the curves of the dependence of this ratio F on the CO2 concentration C in the mixture to be analysed. The curves were obtained on filling a selective receiver with CO2 (curve a) and with a mixture of 8.4% CO2 and nitrogen (curve 6). The gas in the selective sources was heated to 86°C and the ambient temperature was 20°C. Fig 16 shows a single-beam variant of the gas analyser just described. In this case a filter chamber (4) is used in order to absorb radiation of the gas-mixture components which are not analysed; other pirts are analogues of those shown in Fig la.

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SOV/51-7-2-20/34

Use of the Selective Emission of a Gas in Infrared Gas Analysers

Fig 16 shows an arrangement used to minimize the error due to radiation from the walls and windows of the working chamber. Two hot selective sources are used here: one of them is a working chamber (2) and the other a comparison chamber, filled with  $N_2$  (1). A filter chamber, as in Fig 16, is employed and other components are similar to those shown in Fig 1a. There are 2 figures and 2 Soviet references.

SUBMITTED: January 24, 1959

Card 3/3

S/137/62/000/004/029/201 A006/A101

AUTHORS:

Yudelevich, I. G., Shokarev, M. M., Sosnovskaya, T. I., Stanevich,

V. V., Alontseva, N. T.

TITLE:

Spectrographic control of tellurium production

PERIODICAL:

Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 28, abstract 4G178 (V sb. "Nekotoryye vopr. emission. i molekulyarn. spektroskopii",

Krasnoyarsk, 1960, 126-133)

Detailed information is presented on methods of determining Te in semi-products of Pb-manufacture and admixtures in commercial Te. For products containing 0.01 - 0.05% Te, the arc method of exciting the spectra is recommended with admixture of 7% Bi(NO<sub>3</sub>)<sub>3</sub>. To determine high Te contents (up to 10%) spark excitation of spectra is used on a mixture of samples with Cu powder in a 1: 3 ratio, after briquetting under a pressure of 3,000 kg/cm<sup>2</sup>. To determine admixtures in Te, it is evaporated without a buffer from a carbon electrode crater of 5 mm depth and 4 mm in diameter. Graduation graphs are given. There are 5 references.

[Abstracter's note: Complete translation]

A. Tseydler

Card 1/1

S/137/62/000/001/216/237 A154/A101

AUTHOR9: Stanevich, V. V., Kagarmanova, V. M.

Assaying-spectral determination of bismuth in the raw material and semiproducts of lead production

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 1 - 2, abstract 1K5 ("Metallurg. i.khim. prom-st' Kazakhstana. Nauchno-tekhn. sb.", 1961, no. 1 (11), 48 - 49).

TEXT: An assaying-spectral method was developed for determining Bi in Pb concentrates, agglomerate, dust, smelting-furnace slags in Pb-Zn production, dross, dry alkaline meits and reverberatory-furnace slags. The method is based on the ability of Pb to pollect noble metals and Bi. Crude lead, obtained by assaying melting of samples without litharge and with the corresponding charge, was subjected to spectral analysis. The melting was carried out at 900 - 1,000°C for 25 - 30 min. The crude lead was cast in the form of electrodes. An MCH -22 (ISP-22) spectrograph and a HC -39 (PS-39) arc generator or a HT-1 (DG-1) with an interrupter were used. The analysis was carried out by the three-standards method. The analytical pairs of lines were: Bi - 3,067.7 and Pb - 3,118.9 for

Card 1/2

#### "APPROVED FOR RELEASE: 08/25/2000

#### CIA-RDP86-00513R001652820016-0

Assaying-spectral determination of ...

S/137/62/000/001/216/237 A154/A101

a range of concentrations from 0.002 to 0.05%, and Bi - 2,989.0 and Pb - 2,966.5 for a range from 0.05 to 0.1%. The error for a single determination is  $\pm 5$  - 15% (relative).

A. Shteynterg

[Abstracter's note: Complete translation]

Card 2/2

STANEVICH, V.V.

Polarographic control of lead-zinc production. Zav. lsh. 28
no.9:1145 '62.

1. Nachal'nik TSentral'noy laboratorii Ust'-Kamenogorskogo
svintsovo-tsinkovogo kombinata.

(Lead-Analysis) (Zinc-Analysis)

(Polarography)

STANEVICH, V.V.

Laboratory of the Ust'-Kamenogorsk Combine- an enterprise of communist labor. Zav.lab. 30 no.4:506 '64. (MIRA 17:4)

1. Ust'-Kamenogorskiy svintsovo-tsinkovyy kombinat.

TENIOV, Aleksandr Vladimirovich, prof., doktor tekhn. nauk;
STREVICH, Ye.H., red.

[Fundamentals of hydraulics] Osnovy gigravliki. Moskva,
Energiia, 1965. 183 p. (MIRA 18:3)

STANEVICHED K.

107-57-6-9/57

AUTHOR: Stanevichus, R. (Lithuanian USSR)

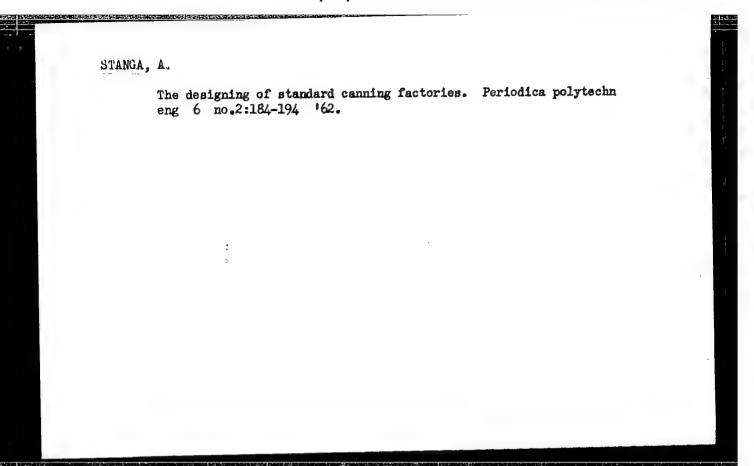
TITLE: Where Can One Buy Batteries? (Gde kupit' batarei?)

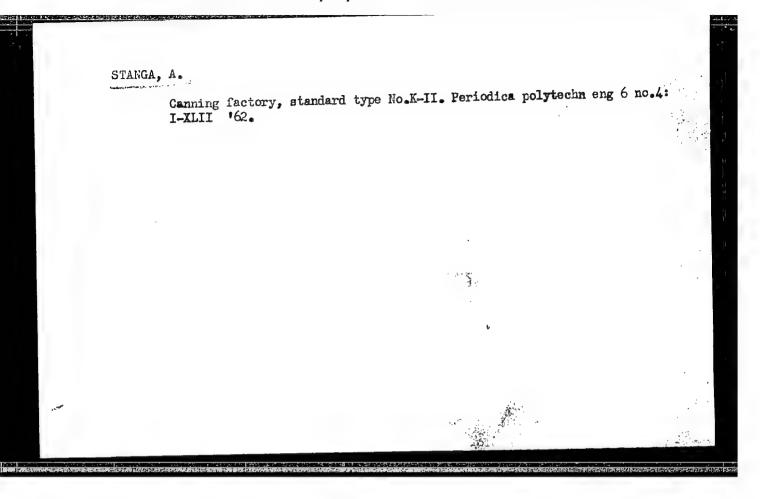
PERIODICAL: Radio, 1957, Nr 6, p 9 (USSR)

ABSTRACT: There are thousands of battery-type radio receivers in Soviet villages but many of them are silent because it is impossible to buy batteries for them. There are no batteries in village shops, nor can you find them in rayon shops, nor does the Soyuzposyltorg mail-order organization supply them.

Editors' reply: The question of where to buy batteries is asked by many radio hams of the RSFSR, Ukraine, Belorussia, and other Soviet republics. During the past years, over three million battery receivers were sold to rural radio amateurs through the Tsentrosoyuz organization only. However, the batteries are being supplied at a much slower rate than the receivers; hence, the silent-receiver pool grows. For example, let us consider the situation in Belorussia: 140,000 battery radio receivers are expected to be in possession of amateurs by the end of 1957. About 176,000 sets of batteries are necessary to supply them. Only one hundred thousand were allotted. Consequently, about 45,000 radio receivers will be kept silent. It is necessary to increase the supply of batteries and also to sell transistor receivers to customers in rural areas as

Card 1/2





STAMA, Ludevit

It is useful to pay attention to the qualification. Unli 5 no. 12: 419-420 D '63.

1. Veduci vychovy kadrov, Nove bane, Novaky.

STANGACILOVIC, D.

STANGACILOVIC, D.

Yugoslavia (430)

Technology

Tertiary clays of the Arandelovac and Kilubara Basins in Serbia. p. 23, Metalurgija, Vol. 2, no. 1, 1951.

East European Accession List, Library of Congress, Vol. 2, No. 4, April 1953. UNCLASSIFIED.

STANGACILOVIC, D.

"The secondary Tertiary layer of kaolinite of the village of Metris, near Negotin", p. 179 (Glasnik. Serija A: Mineralogija, Geologija, Paleontologija, Mo. 4, 1951, Beograd)

So: Monthly List of maxima Accessions, Library of Congress, September 1953, Uncl.

#### "APPROVED FOR RELEASE: 08/25/2000

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Sgirefellatio, Duscu

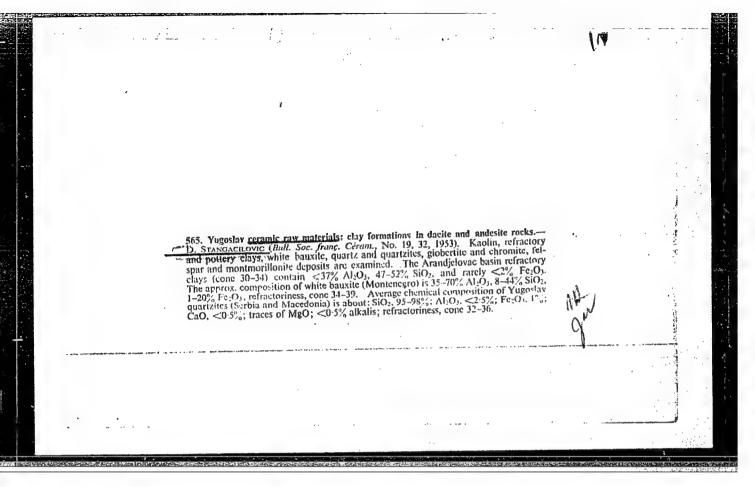
Chemical Abst. Vol. 48 No. 9 May 10, 1954 Mineralogical and Geological Chemistry Montmorillonites (bentonites) of Montenegro. 1 Dusan Stangačilovic, Glasnik Prirod Valuscia Srpske Zemlye (Bull. museum hist. nat. pays Serbe) Sér. A. Mineralog., glol., paléontol. No. 5, 55-83(1952)(in French 74-83).

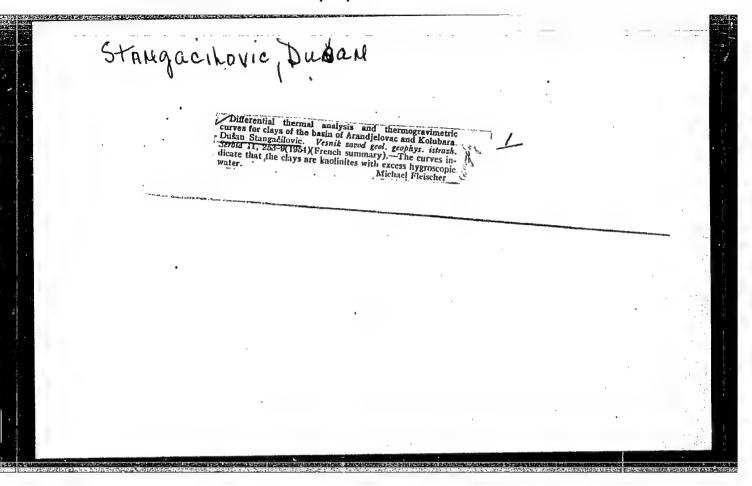
Large deposits of montmorillonite, previously thought to be kaolin, are described vith chem. analyses, particle-size detns., and Atterberg limits. The deposits were formed by the alteration of volcanic tuffs. Michael Pleischer

STATGAULLUVIC, D.

"The clays of Serbia." p. 365. (Friroda, Vol. 18, no. 6/7, 1953. Zagreb)

SU: Monthly List of East European Accessions, Vol. 3, no. 3, Library of Congress, March, 1954. Uncl.





D

STANGACHILOVICA, D

Category: Yugoslavia

Abs Jour: RZh--Kh, No 3, 1957, 7848

Author : Stangachilovich, D. and Paveshich, D.

: Not given Inst

: Geochemical and Sedimentation Characterization of Kolubar Clays Title

Orig Pub: Geol. an. Balkan. Poluostrova, 1955, Vol 23, 147-162 (in Serbian

with a German summary)

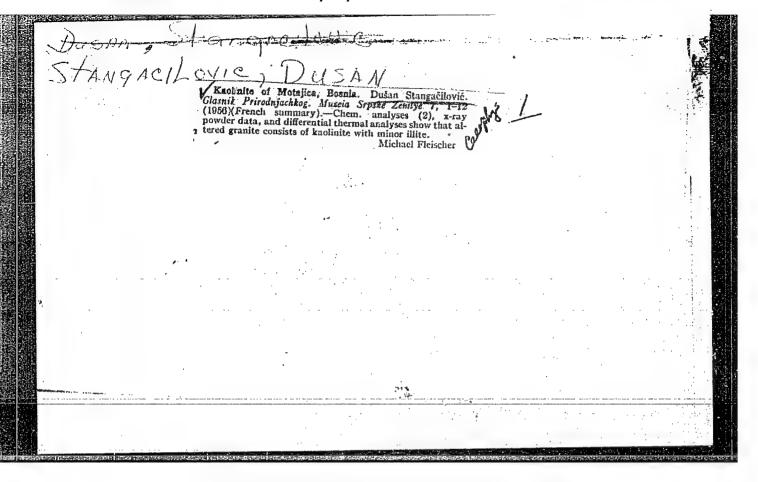
Abstract: The geochemical conditions under which the above-named clays were

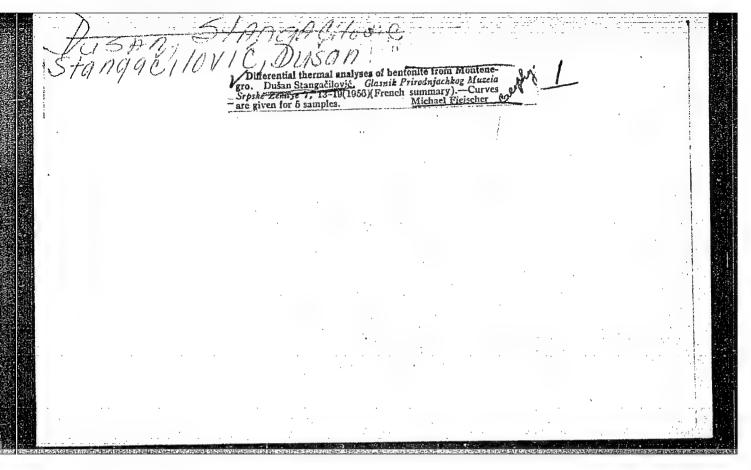
formed have been reproduced on the basis of sedimentation analyses

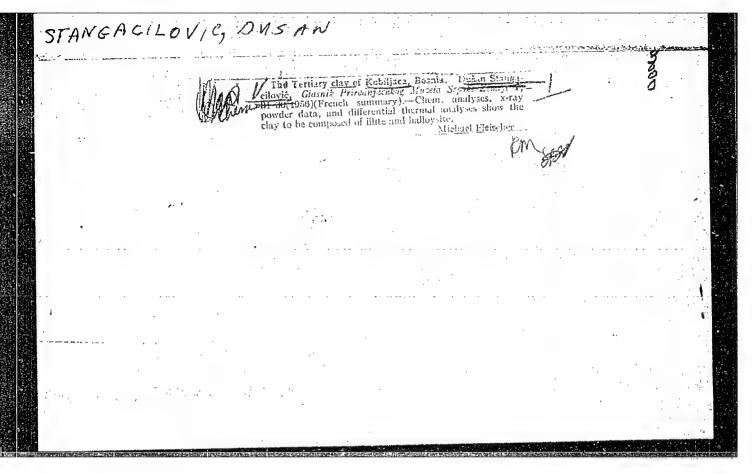
and technical tests.

: 1/1 Card

-28-







#### STANGACILOVIC, D.

Thermal differential analysis of our halloysites of the hydrothermal origin.

p. 105 (Glasnik) Vol. 7, no. 3, 1956, Belgrade, Yugoslovia

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC, VOL. 7, NO. 1, JAN. 1958

STANGACHAVIC, D.

Kaolin ore from the Bujanovac antimony deposits and attempts to improve the dressing. n. 713. TEHNIKA (Savaz inzenjera i techicara Jugoslavije)
Beogard. Vol. 11, no. 5, 1956

SOURCES: East Europe Accession List (EEAL), Library of Congress, Vol. 5, no. 11, Nov. 1956

The state of the following

Yugoslavia/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5143

Author: Stangacilovic, Dusan

Institution: None

Title: Quartz-Containing Clays in White Bauxites

Original

Publication: Tehnika, 1956, 11, No 7, 1005-1009

Abstract: In all the Montenegrin deposits of white bauxites, located in areas

of typical karst, quartz-containing clay (QCC) has been encountered. The latter is situated in upper or in the underlying strata of white bauxite deposits. QCC has also been found in upper strata of red bauxite deposits of the Triassic. Deposits of white bauxites and QCC have undergone substantial action of tectonic processes. The clays are represented by kaolinite and metahaluasite, and in individual instances contain a small amount of gibbsite. Data are presented concerning the chemical composition of high-alumina clays of the deposit

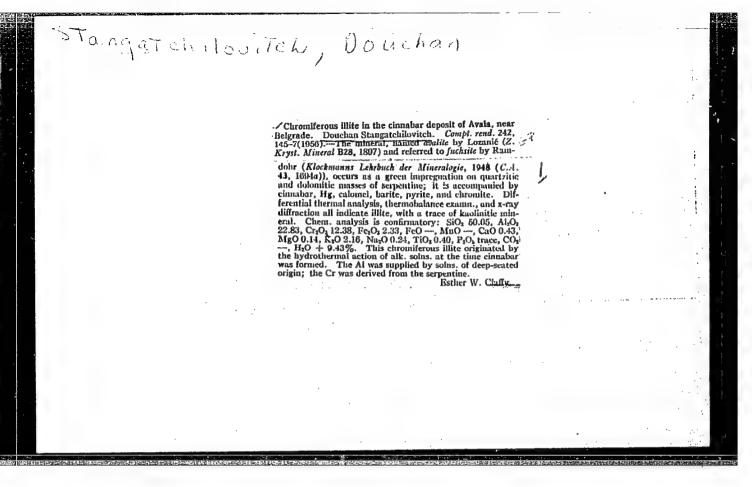
under consideration as well as of foreign origin (French and American).

Card 1/1

## STANGACILOVIC, D.

Kaolinite from Metris. p. 1173. TEHNKA (Savaz inzenjera i techicara Jugoslavije) Beogard. Vol. 11, no. 8, 1956.

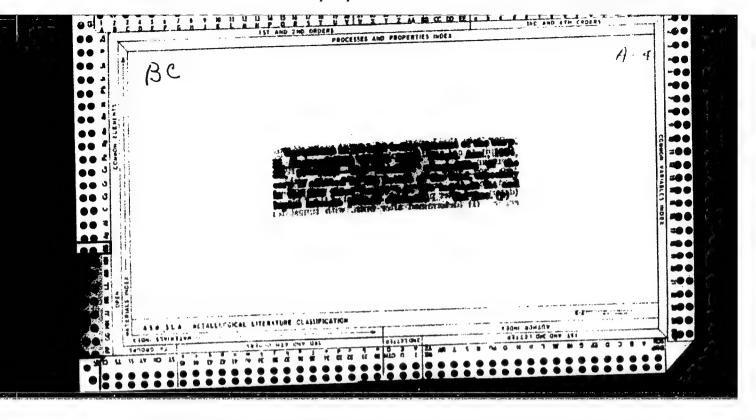
SOURCE: East Europe Accession List (EEAL), Library of Congress, Vol. 5, no. 11, Nov. 1956



STANGACILOVIC, Dusan, geolog (Beograd, Dalmatinska 97)

Hydrothermal kaolinization of granite in the Bujanovac antimony basin, enrichment of kaolinized mass, and possibilities of their application in paper industry. Tehnika Jug 18 no.10sSupplement: Rudarstvo metalurg 14 no.10s1845-1854 0.63.

STHNGE, B SOUNTRY : LUNGARY : Chemical Technology. Chemical Products and CATEGORY Their ipplications. Cellulose and Its Deriva-\* ABS. JOUR. : REKhim., No. 19, 1959, No. 69951 : Maleer, has Staure, D. : Production Technology of Cellulese from Straw TITL at the Solnoc City Flant. ORIG. PUB. : Paniripar es magyar graf., 1958, 2, No5, 184--185: The authors present a number of corrections ARCTRACT in the cellulose processing scheme, proposed by them. Based on these corrections a new processing scheme is being proposed. See Ref. Zhur.-Khimiya, 1959, No 11, 40937. -- S. Rozenfel'd. \*tives. Paner. Carb: 1/1



STANGEBERG, H.

"Teaching the Scope and Sphere of the Biological Sciences in the School of Sanitation Engineering." p. 139 (GAZ, WODA I TECHNIKA SANITARNA, Vol. 27, No. 5, May 1953) Warszawa

SO: Monthly List of East European Accessions, Library of Congress, Vol. 2, No.10. October 1953. Unclassified.

STANGEMBERG, N.

Meeds and possibilities of the co-operation between scientists and the Central Board of Fisheries in the light of present needs of Polish fisheries. p. 5.

EKOLGIA POLSKA. SERIA B. (Polska Akademia Mauk. Komitet Ekologiczny) Warszawa. Vol. 1, no. 1/2, 1955.

FOLAND

SOURCE: East European Accessions List LC Vol. 5, no. 7, August 1956.

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|       | Scientific basis of lake lisheries. D. 100. (1915) A SHRUM MERCHES TOLOGET. Tol. 3, 1915, Marsenwa, Moland) |
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| St. : | Monthly List of Mast Apropean Accessions (MAL) D. Fol. 0, no. 12, Fec. 1957. Uncl.                          |
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LINNYENGERG M.

COUNTRY

: Poland

CATEGORY

ABS. JOUR: : AZKhim., No. 20 1939, No. 71174

ACTHOR

: Stangenberg, M.

F352. TITLE

: Chemical Composition and Bacteriological

Characteristics of Water of the River Neman

ORIG. PUB.: Polskie arch. hydrobiol., 1958, 4, 67-121

ABSTRACT : Chemical and bacteriological analyses of water of the river Neman were conducted during the lowwater period in the summer (17 June - 7 July 1939), from the town of Stolpce to the town of Druskieniki, over a distance of 385 km; 20 stations were made over this stretch. Flow of water at the town of Stolpce was 7 m3/second, at the town of Grodno -- 11k m3/second. The entire portion of the Merry that was a still a stretch. the Meman that was under study, is affected by the sur-rounding forests, especially along the upper course and the downstream. The middle part of the stretch is affected by the clayey banks. Follution of the water is brought about by the towns of Stolpce; Grodno, and Druskeniki, and

CARD: 1/2

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652820016-0"

ABS. JOJR. ; RZKhim., No. 20 1959. No. 71174

AUTHOR

IMST.

TITLY

oale. PUB. :

ABITRAUT : by a number of industrial localities along the Nemar, and its tributaries. Chemical analysis data on 02, CO2, hardness, alkalinity, C1-, SO42-, blogenous comprients, and organic matter, are presented. Content of solids is 204-268 mg/liter, 90% of which are dissolved substances, and 10% suspended matter. -- V. Konshin.

CARD: 2/2

COUNTRY : Poland

CATEGORY : Cosmochemistry. Geochemistry. Hydrochemistry.

ABS. JOUR.: REKhim., No. 19, 1959, No. 67575

AUTHOR : Largenberg, M.

TNST. : Chemical Composition of River Water in

Poland

ORIG. PUB.: Polskie arch. hydrobiol., 1958, 4, 289-359

ABSTRACT: Extensive data are presented on chemical composition of river water in Poland. It was found that the chemical composition varies along the course of the river, as well as throughout the year; the principal factors of the variation are water level, inflow of runoff, and the of the variation are water level, inflow of runoff, and the biological processes. Maps are shown depicting distribution biological processes. Maps are shown depicting distribution, and B.O.D. It was ascertained fe, coloration, oxidability, and B.O.D. It was ascertained that amount of CI- increases in streams to the west of the Vistula are characterized by a sharp increase of pollution, while all the right-bank tributaries of the Vistula -- by a

CARD: 1/2

#### STANGENBERG, M.

"Outlines of limnology (Hydrobiology of fresh water)" by F.Ruttner. Reviewed by M.Stangenberg. Polskie arch hydrobiol 11 no.2:261-262 \*63.

STANGENBERG, Marian

Fifteenth International Limnologic Congress in the United States,
August 11-September 3, 1962. Kosmos biol 12 no.3:327-333 '63.

STANGENBERG-OPOROWSKA, K.; SOLSKI, A.

(2) 中国は記録を出ることとはは、大学は、大学を表現して、中国である。

State of pollution of the upper course of the Oder River. Polskie arch hydrobiol 12 no. 1:81-123 '64.

 Department of Limnology and Fishing, College of Agriculture, Wroclaw.

STANGL, Branko

Functional causes for descritication in tuberculous patients. Tuberkuloza 16 no.3:259-262 My-Ag '64

1. Institut za tuberkulozu, Golnik (Direktor: doc. dr. Bojan Fortis).

STANGL, Branko

Respiratory changes in pulmonary carcinoma. Tuberkuloza 17 no.1/2: 126-134 Ja-Ap 65.

l. Institut za tuberkulozu, Golnik (Direktor: doc. dr. Bojan Fortic).

STANGL, Branko; FORTIC, Majda

Bronchospirometry. Ft.2. Tuberkuloza 17 no.3:196-205 My-Je '65.

1. Institut za tuberkulozu Socijalisticke Republike Slovenije, Golnik (Direktor: doc. dr. Bojan Fortic).

KREJZA, Miroslav; KUBICKOVA, Irena; STANGL, Jiri

Gastric ulcer in an 8-months-old child. Cesk. pediat. 16 no.12:1110-1113 D '61.

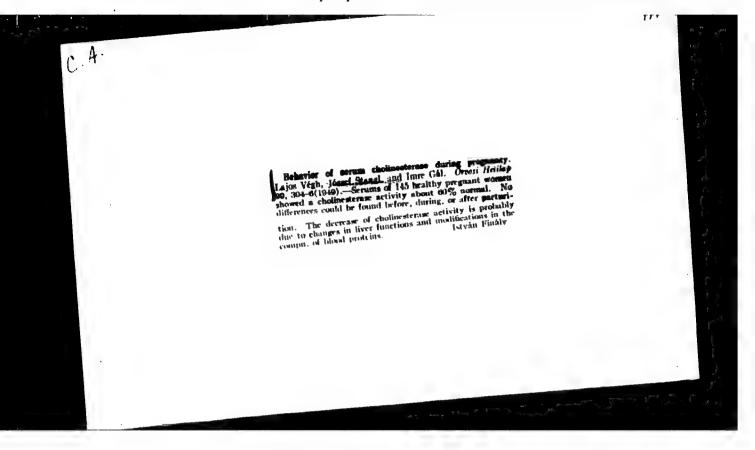
1. Detske oddeleni OUNZ Pribram, prednosta MUDr. M. Krejsa Ustredni rentgenologicke oddeleni OUNZ Pribram, prednosta MUDr. F. Trefny.

(PEPTIC ULCER in inf & child)

STANGL, Jozsef, dr.

Genital tuberculosis and pregnancy. Orv. hetil, 104 no.2:73-74 13 Ja 163.

1. Jarasi Tanacs Korhaza Kisvarda, Szuleszet-Nogyogyaszati Osztaly. (TUBERCULOSIS, FEMALE GENITAL) (PREGNANCY COMPLICATIONS)



STANGL, Jozsef, dr.

Cases of tuberculosis of the portio and vagina. Magy. noorv. lap.

19 no.3:189-192 May 56.

1. Jarasi Tanacs Korhasa Kisvarda.
(TUBERCULOSIS, FEMALE GENITAL, case reports
portio vaginalis & vagina, pathol. (Hun))

Three-fold dermoid cyst (teratoms) covered by the gastric nucosa of the tuba uterina with oleogranuloma. Magy.noor.lap. 20 no.6: 320-327 N '59.

1. Szabolcs-Szatmar Megyei Tanacs Korhaza Kyisechaza (Igazgato: Banko Laszlo dr.) korbonctani-korszovettani osztalyanak (Foorvos: Gerlei Ferenc dr.) es a Jarasi Tanacs Korhaza Kievarda (Igazgato: Kondrai Gero dr.) szuleszeti-nogyogyaszati osztalyanak (Foorvos: Falloplan Tubes neopl)

(Talloplan Tubes neopl)

(GRANULOMA compl)

STANGL, Jozsef, dr.; KONDRAI, Gero, dr.

Ileusin pregnancy. Orv. hetil. 103 no.22:1032-1035 3 Je '62.

1. Jarasi Tanacs Korhaza Kisvarda, Szuleszet- Nogyogyaszati es Sebeszeti Osztaly.

(PREGNANCY compl)

(INTESTINAL OBSTRUCTION in pregn)

EUV X

Manual, see Dry Foundtin of the decas Conneil, Department o destrined and Typecology (Varani Capacs Mornage, beu-Lonet-Boggogyaszati Gastaly), Miswarda.

"Preproduction of the Cardbala and Preguency."

Sudapest, Orvesi Hetilup, Vol 104, Ro 2, 13 Can 65, pp 72-

Concerning the controversy Abstract: Dencering the Controvers of whether genital tuberculosis and pregnancy hay occur at the same time, the anther describes two cases of histologreatly demonstrated tubel tuberculosis in women with expresidentian pregnancies. A case of two successful pregnancles following tuberculostatic tractment of a woman with tubel tuberculosis is also described. Ours of genital tuberculesis remains an open question. Of 22 references, about half are Hungarian, the rest western.

1/1

STANGL, R.

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CZECHOSLOVAKIA/Analytical Chemistry. Analysis of Inorganic Sub-E-2 stances.

Abs Jour: Ref. Zhur.-Khimiya, 1958, No II, 35925.

: Z. Bazl, Z. Plasil, R. Stangl. Author

: Not given.

: Contribution to the Determination of Arsenic by the Tnst Title

Extraction Method.

Orig Pub: Rudy, 1957, 5, No 12, Prace vyskumn ustavu, 1957, Priloha No. 7, 1-4.

Abstract: A description of a speedy method of determination of As in ores. As (after reduction up to the 3-valent state) is extracted from a strong hydrochloric acid solution (10.5-II n.) by a single shaking up with CHCl3, reextracted from the layer of CH Cl3 by a single shaking up with water

Card : 1/2

SULGEK, Z., POVONDRA, P., STANGL, R.

Chromatographic separation of lithium ions and sodium ions. Coll Cz Chem 30 no.2:380-387 F 165.

1. Zeneralinstitut für Geologie und Polarographisches Institut, Tschechoslowakische Akademie der Wissenschaften, Prague. Submitted January 10, 1904.

STANGLEWICZ, Arkadiusz, inz.

A problem of broadening an existing road bridge. Inz i bud 21 no.11:403-404 N  $^{1}64$ .

1. Chief engineer, Administration of the Construction of Workers' Settlements, Warsaw.

STHAT

ALBANIA / Plant Diseases. Diseases of Cultivated Plants

N - 3

Abs Jour : Ref Zhur - Riol., No 6, March 1957. No 22952

Author : Stani

: A new Preparation Made by the Scientific-Experimental Agri-Title

cultural Institute for Controlling Wheat Rust (Tilletia levis).

Orig Pub : Bul. shkenc. natyr., 1955, No 1, 93-103

Abstract : Good results of seed disinfection were obtained from a mixture

of 30 parts of copper sulfate and 70 parts of ash. 300-400 g of the mixture is necessary for 1 centner of seeds. This preparation may be used as a substitute for granosan.

: 1/1 Card

STANI, A.

"Biological characteristics of the pink bollworm cotton insect (Pectinophora gossypiella Saund) and how to control it"

Buletin. Seria Shkencat Natyrore. Tirane, Albania. Vol. 12, no. 4, 1958

Monthly list of East European Accessions (EEAI), IC, Vol. 8, No. 6, Jun 59, Unclas

STANIC, D.

The Salzburg-Vienna highway.

p. 82 (Put I Saobracaj) No. 1/3, Jan./Mar. 1957, Belgrade, Yugoslovia

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC, VOL. 7, NO. 1, JAN. 1958

hirlanu, Andrei, inz. (Str. Nikolae Jorgu 4, Cluj, NK luminija); TUDOSIE, Constantin, inz.; STANIC, Joko, inz., asistent [translator].

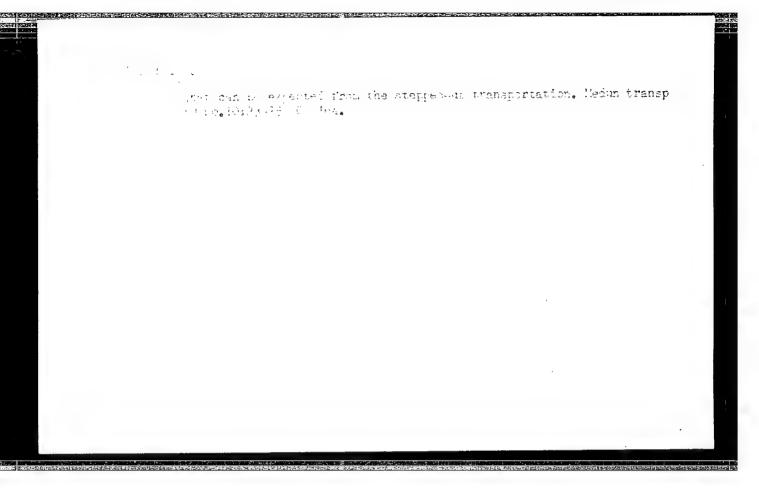
Processing of flat surfaces by grinding. Tehnika Jug 19 no.1: Suppl: Masinstvo 13 no.1:85-90 Ja 164.

1. Saradnici Politehnickog instituta u Cluju (for hipianu and Tudosie). 2. Masinski fakultet, Beograd (for Stanic).

STANIC, Luka

What can we expect from the system of accelerated transport?

Zeleznice Jug 20 no.7:7-9 Jl '64.



STANIC, M., Dr.

Experimental basis of vaccines against diphtheria. Higijena, Beogr. 7 no.1-4:169-186 1955.

1. Centralni higijenski saved, Zagreb.

(DIPHTHERIA, prev. & control
 vaccine (Ser))

(VACCINES AND VACCINATIONS,
 diphtheria vaccine (Ser))

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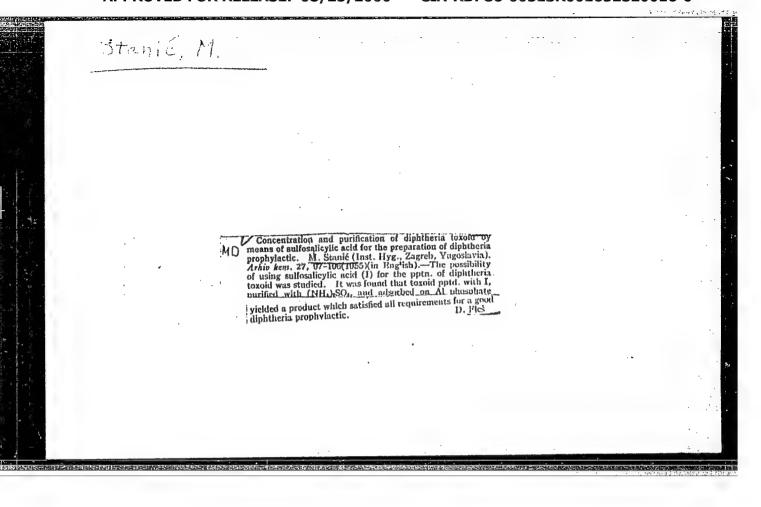
CIA-RDP86-00513R001652820016-0

STANIC, Mirko; Dr. (Zagreb)

Snake bite. Med.glasn. 9 no.5:157-158 May '55.

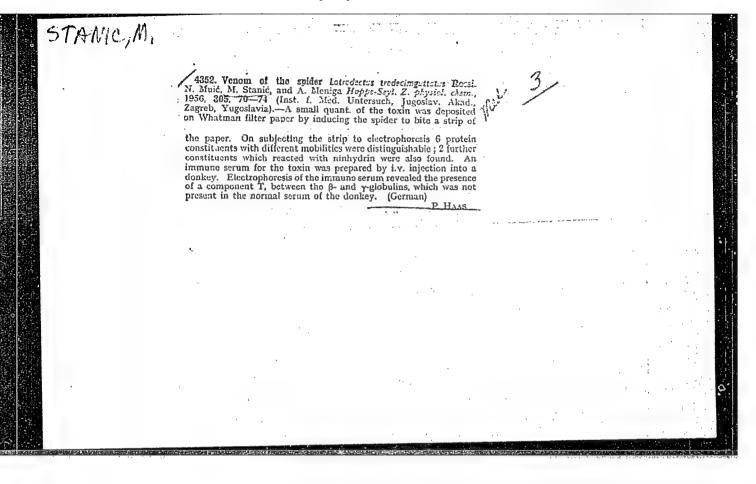
(SNAKE BITES.

vipers. physiol. & antiserum (Ser))



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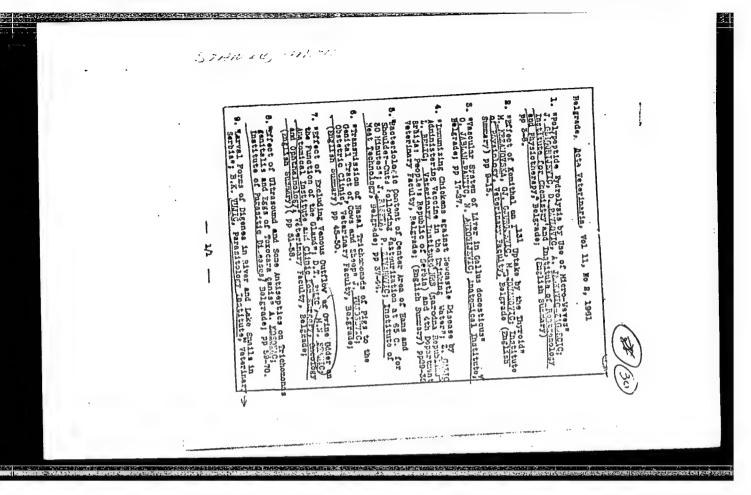


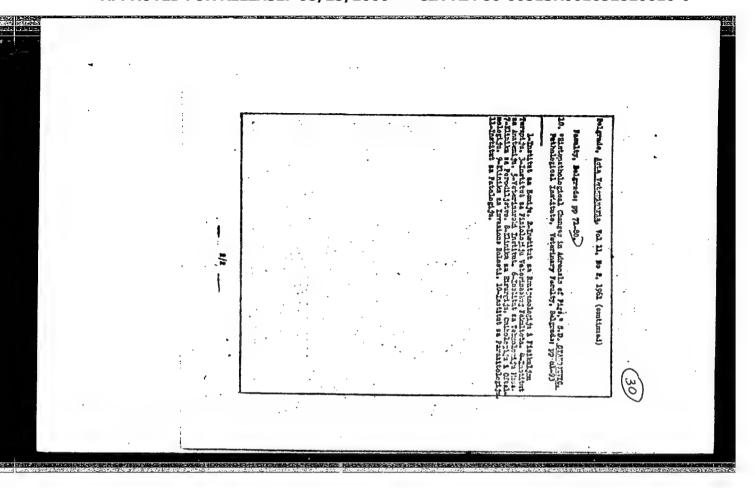
STANIC. M.

65 Years of treatment and prophylaxis of diphtheria. Highjena, Beogr. o no.1:71-76 1957.

1. The Diphtheria Section of the Central Institute of Hygiene at Zagreb, Yugoslavia.

(DIPHTHERIA, prev. & ther. (Ser.))





TOMASEGOVIC, Z.; JANKOVIC, Z.; PETKOVIC, V.; STANIC, M.; BETLHEIM, S.; BLAZEVIC, D.; PERSIC, N.; ZORINC, S.; TEODOROVIC, B.; VRANCIC, J.; VODOPIJA, I.; ANTONIAZZO, Z.: CULIC, R.; GALINOVIC-WEIGGLASS, M.; REMACK, M.; MRAVUNAC, B.; KOEHLER-KUBELKA, N.; CEZNER, M.; KOHN, V.; TEKAVCIC, B.; EMILI, H.; SMERDEL, S.; SOOS, E.; VUKSANOVIC, V.; JANJATOVIC, M.; DERVICEMA, I.; CRUENWALD, P.; SKRABALO, Z.; CREPINKO, I.; HAUPTMANN, E.; VIDACEK, S.; HORVAT, A.; MIOCKA, O.; IVANCEVIC, D.; PERGER, A.; KRSNJAVI, B.; PRAZIC, M.; SALAJ, B.; SUBOTIC, R.; RADOSEVIC, Z.; KELERBACOKA, M.; HAHN, A.; MATKOVIC, B.; RADONIC, M.

Reveiw of periodicals; medicine. Bul sc Youg 9 no.4/5:145-147 Ag-0 '64.

CVETKOV, Radojica; STANIC, Radisa

Isolated dextracardia in Marfan's syndrome. Med. pregl. 17 no.7: 387-390 '64

1. Interno odeljenje Opste bolnice \*Djordje Joanovic\*, Zrenjanin (Nacelnik: Prim. dr. Bosa Grujic).

STANIC, Rodoljub
Yugoslav river navigation. Medun transp 9 no.5:365-368 My '63.

1. Generaldirektor der Jugoslavischen Flusschiffahrt.

STANIC, S.

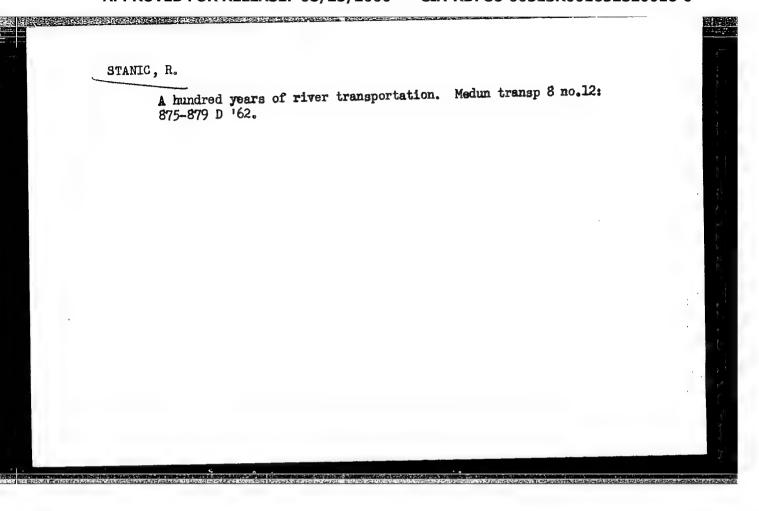
Survey of improvements in food technology. p. 264. (Kemija U Industriji, Vol. 5, no. 10, October 1956. Zagreb, Yugoslavia)

SO: Monthly List of East European Accessions. (EEAL) LC. Vol. 6, No. 7, July 1957. Uncl.

STATIC, S.; SULAJA, V.

The effect of conditions of rotary cutting points on the quality of surface in lathe final finishing. p. 1363. (Tehnika, Vol. 11, no. 9, 1956. Boograd, Yujoslavia)

SO: Monthly List of Best Duropean Accessions. (MMAL) LC, Vol. 6, No. 7. July 1957. Uncl.



VASIC, K.; IVANOVIC, Jelisaveta; MAKSIMOVIC, M.; STANIC, Vlasta; DORDEVIC, M.

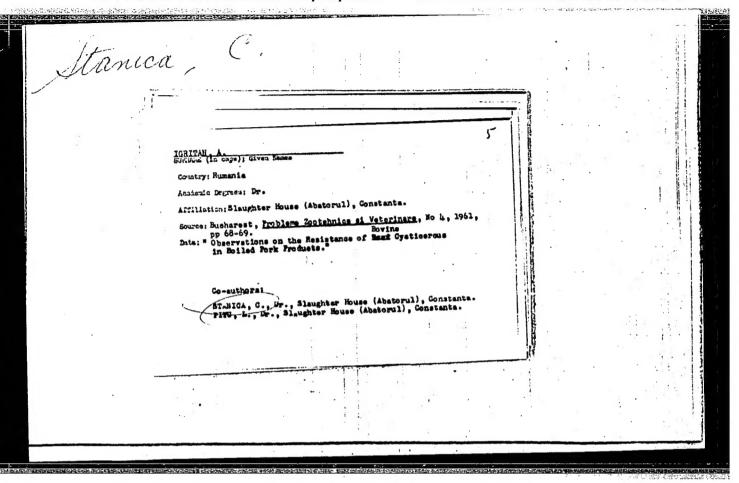
Morphogenetic differentiations, and oxygen consumption during the embryonal development of Lymantria dispar L. Arh biol nauka 13 no.3/4: 181-197 '61.

1. Bioloski institut, Beograd.

STANIC, Zdravko (Beograd)

Use and application of marble in a rational building of houses.

Gradevinar 16 no.9:338-340 5 '64.



ARDELEAN, I.; CALALB, Gh.; IENISTEA, C.; MESROBRANU, L.; GRIGORIU, T.; STANICA, E.; DUMITRESCU, V.; NITRICA, N.; FOTINO, M.

Anti-diphtheria vaccination in the Rumanian People's Republic; study of the immunizing value of diphtheria anatoxin of Ramon as compared with precipitated anatoxin. Stud. cercet. inframicrobiol., Bucur. 6 no.3-4:477-512 July-Dec. 1955.

(DIPHTHERIA, prev. & control vacc., comparative value of Ramon's anatoxin & precipitated anatoxin)

(VACCINES AND VACCINATION
diphtheria vaccines, comparative value of Ramon's anatoxin
& precipitated anatoxin)